Summary: Math questions from an art museum

Monthly Math Hour at UW, April 28, 2019

Natasha Rozhkovskaya
Kansas State University

Abstarct: We will look at three works of art by Sol Lewitt, Maurits Cornelis Escher and Carlo Crivelli and use them to explore mathematical questions in the fields of combinatorics, complex analysis, and Euclidean geometry.

I. Solomon LeWitt (1928 – 2007)

Artwork mentioned in the talk:

1, 3, 5, 7, 9, 11 (tower) from Nelson-Atkins Museum of Art in Kansas City. Can be found in the online catalogue of the museum, object number F99-33/8)

Wall Drawing 386 (star polygons) First installation: Carol Taylor Art, Dallas, Texas. January 1983. Courtesy of the Estate of Sol LeWitt.

Serial Project, I (ABCD) 1966.

Wall Drawing #1136

Wall Drawing #260

Incomplete Open Cubes, 1974

Resources:

Article by M.Reb, N. Rozhkovskaya, *Is The List of Incomplete Open Cubes Complete?* Nexus Network Journal, vol. 17, no. 3, (2015).

Abstract: Variations of Incomplete Open Cubes is the major project by important conceptual artist of the XXth century Solomon LeWitt. In this paper we interpret the enumerative component of the project as embeddings of graphs. The conclusion is that the artist found the correct number of structures (that is 122), however his list contains a mistake in the presentation of a pair of incomplete cubes. Link to preprint version: https://www.math.ksu.edu/~rozhkovs/LeWitt_cubes.pdf

II. Maurits Cornelis Escher (1898 -1972)

Artwork mentioned in the talk:

Print Gallery (1956)

Resources:

Webpage of the project at the University of Leiden Escher and the Droste effect: http://escherdroste.math.leidenuniv.nl

Article by B. de Smit and H. W. Lenstra Jr., *The Mathematical Structure of Escher's Print Gallery* **NOTICES OF THE AMS VOLUME 50, NUMBER 4 April 2003**, http://www.ams.org/notices/200304/fea-escher.pdf

Animation on Youtube e.g. here: https://www.youtube.com/watch?v=9WHdyG9mJaI

III. Carlo Crivelli (1430-1495)

Artwork mentioned in the talk:

The Annunciation, with St. Emidius (1486) National Gallery, London. High definition reproduction can be found in the online catalogue of the museum.

Annunciation, Leonardo da Vinci and Andrea del Verrocchio,the Uffizi gallery of Florence, Italy.

The Wedding Feast at Cana, Paolo Veronese, Louvre, France.

IV. Other suggested resources on Art and Mathematics:

Book by Lynn Gamwell, *Mathematics and Art: A Cultural History (2015)*
Book by N. Rozhkovskaya, *M is for Math, Museum, and Manhattan, Kansas* (2017)
Examples of art and math connections at website www.i70math.com